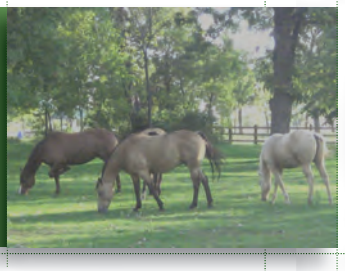
University of Minnesota Extension
Horse Program

Plants Poisonous or Harmful to Horses

Nitrate Accumulators

Krishona Martinson, PhD; Lynn Hovda, DVM, MS; and
Mike Murphy, DVM, PhD



Providing research-based information to Minnesota horse owners

Curly dock

Lambsquarter

Species: Common Lambsquarter *(Chenopodium album)*, Redroot Pigweed *(Amaranthus retroflexus)*, Curly Dock *(Rumex crispus)*, and Sorghum-sudangrasses *(Sorghum* species*)*.

Origin: Native to North America (red root pigweed), introduced from Europe (common lambsquarter, curly dock) and Africa (sorghum-sudangrass).

Lifecycle: Annual (common lambsquarter, redroot pigweed, sorghum-sudangrass); perennial (curly dock).

Identification: Common lambsquarter: can grow to three to four feet in height, branched, with toothed leaves that tend to have a white coating on the upper-side of leaves, especially when in the seedling stage. Flowers are small and green. Redroot pigweed: can grow to three to four feet in height, stems rough and branched. Leaves dull green and oval in shape. Flowers are green, small and prickly to the touch. Curly dock: can grow to one to four feet in height, with long, wavy green leaves. Flower are located in bunches, and turn from a greenish color to a reddish-brown color when mature. Sorghum-sudangrass: stems are erect and solid and reach a height of two to twelve feet. In many respects, the structure, growth, and general appearance is similar to corn.

Distribution: All are found throughout the United States.

Habitat: All are found in cultivated fields, pastures, and roadsides.

Uses: Sorghum-sudangrass has good yield potential and can be used for pasture or hay. The crop is most commonly used during times of high temperatures and drought, usually as emergency forage for cattle. Even though sorghum-sudangrass is not commonly grazed by horses or fed in horse-quality hay, it might be fed during times of drought when other forage is limited. If buying sorghum-sudangrass during a drought year, test the forage for excessive nitrates before feeding it.

Control: Annual weeds, like common lambsquarter and redroot pigweed, are easily controlled with timely mowing and proper pasture management. Perennials weeds like curly dock are difficult to control. Timely mowing alone may take several years before adequate control of perennial weeds are achieved. Several herbicides exist that provide adequate control of common lambsquarter, redroot pigweed and curly dock. However, multiple herbicide applications may be needed for adequate control of curly dock. Most weeds are better controlled by

Redroot pigweed

Sorghum species

herbicides when they are small. Larger plants may need to be removed by hand pulling, as stems become woody, and adequate control with mowing and herbicides will be difficult. When using a herbicide, be sure to follow all grazing restrictions and other pertinent information stated on the herbicide label.

Toxin: Nitrate.

Toxicity: Nitrate in the plant is converted to nitrite in the gastrointestinal track of animals. If nitrite is absorbed in the blood in sufficient quantities it may convert hemoglobin to methemaglobin. Methemaglobin does not release oxygen to tissues, and can interfere with the animal's ability to use oxygen. Ruminate animals like cattle and sheep are reported to be about ten times more susceptible to nitrate poisoning than horses because their rumen converts nitrate to nitrite. The same reaction may take place in the cecum (hindgut) of horses but to a lesser extent. Thus, horses are generally more tolerant of higher concentrations of nitrate in forage than cattle are.

When Toxic: Nitrate concentrations of plants tend to be higher in young rapidly growing plants, those that have had nitrogen fertilization, and after cloudy days. Research has shown that feeding hay containing 1.5 to 2% nitrate to pregnant and non-pregnant mares resulted in clinically normal foals, even though higher than normal levels of nitrate were detected in blood samples.

Signs and Effects of Toxicosis: Symptoms of nitrate poisoning in horses include: difficulty breathing, bluish-colored mucous membranes, weakness, tremors, and possibly death.

Treatment: Nitrate exposure has also been associated with goiter (or hypothyroidism) because of the potential for nitrate to interfere with iodine. Offering horses iodized salt is the most practical means of preventing nitrate associated goiter.

Other Information: DHIA (320-352-2028), Dairyland (320-240-1737) and the Minnesota Veterinary Diagnostic laboratory (612-625-8787) can test hay for nitrate concentrations. See the "Drought and Frost Concerns" fact sheet for additional information on nitrate.

Thanks to the following fact sheet reviewers: Ron Genrick, Assurance Feeds and Harlan Anderson, DVM.
Photos provided by the University of Minnesota Strand Memorial Herbarium.

In Partnership...

This fact sheet was funded by the Minnesota Racing Commission

University of Minnesota Extension

Minnesota Equine Research Center
College of Veterinary Medicine
University of Minnesota